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N. Little

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reissue Patent Application of)
U.S. Patent No. 5,088,108) Group Art Unit: 2603
UDDENFELDT et al.)
Serial No.: 08/136,760) Examiner: B. Safourek
Filed: October 15, 1993)
For: CELLULAR DIGITAL MOBILE)
RADIO SYSTEM AND METHOD)
OF TRANSMITTING INFORMATION)
IN A DIGITAL CELLULAR)
MOBILE RADIO SYSTEM)

SECOND SUPPLEMENTAL AMENDMENT PURSUANT TO 37 C.F.R. § 1.116

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In further response to the Office Action dated June 13, 1996, kindly amend the above-identified application as follows:

IN THE CLAIMS:

Please amend claims 18 and 34 as follows.

Please amend claim 18, on lines 19-21 by deleting "during a reception time interval,
said time shift being in the range of less than to a few times greater than said
difference in radio propagation delays".

Please amend claim 34, on lines 19-21, by deleting "during a reception time interval,
said time shift being in the range of less than to a few times greater than said
difference in radio propagation delays".

Please add claims 37-62 as follows:

37. The cellular mobile radio system of claim 1, further comprising:
means for handing off a mobile station from one of said at least two
base stations to the other of said at least two base stations.

38. The cellular mobile radio system of claim 1, further comprising:
means for terminating a radio signal from one of said at least two base
stations.

39. A method as claimed in claim 6, further comprising:
handing off a mobile station from one of said at least two base stations
to another of said at least two base stations.

40. A method as claimed in claim 6, further comprising:
terminating a radio signal from one of said at least two base stations.

41. The cellular mobile radio system of claim 10, further comprising:
wherein a mobile station is handed off from one of said at least two
base stations to another of said at least two base stations.

42. The cellular mobile radio system of claim 10, further comprising:
wherein a radio signal is terminated from one of said at least two base
stations.

43. The cellular mobile radio system of claim 13, further comprising:
wherein a mobile station is handed off from one of said plurality of
base stations to another of said plurality of base stations.

44. The cellular mobile radio system of claim 13, further comprising:

wherein a radio signal transmitted from one of said plurality of base stations is terminated.

45. The cellular mobile radio system of claim 14, further comprising:
means for handing off said mobile station from one of said base stations to the other base station.

46. The cellular mobile radio system of claim 14, further comprising:
means for terminating a radio signal from one of said base stations.

47. The cellular mobile radio system of claim 18, further comprising:
wherein a mobile station is handed off from one of said base stations to the other base station.

48. The cellular mobile radio system of claim 18, further comprising:
wherein a radio signal is terminated from one of said base stations.

49. The cellular mobile radio system of claim 26, further comprising:
means for handing off a mobile station from one of said at least two base stations to another of said at least two base stations.

50. The cellular mobile radio system of claim 26, further comprising:
means for terminating a radio signal from one of said at least two base stations.

51. The cellular mobile radio system of claim 29, further comprising:
means for handing off a mobile station from one of said plurality of base stations to another of said plurality of base stations.

52. The cellular mobile radio system of claim 29, further comprising:

means for terminating a radio signal from one of said plurality of base stations.

53. The cellular mobile radio system of claim 30, further comprising:
means for handing off a mobile station from one of said base stations to the other of said base stations.

54. The cellular mobile radio system of claim 30, further comprising:
means for terminating a radio signal from one of said base stations.

55. The cellular mobile radio system of claim 34, further comprising:
means for handing off a mobile station from one of said base stations to the other of said base stations.

56. The cellular mobile radio system of claim 34, further comprising:
means for terminating a radio signal from one of said base stations.

57. A cellular mobile radio system for communicating message information and having a plurality of cells, comprising:

a first base station for transmitting a first signal having message information into a cell,

a second base station for transmitting a second signal having said message information into said cell,

a mobile station in said cell having a receiver that receives said first and second signals, wherein said first and second signals are received with a propagation delay therebetween,

wherein both of said first and second base stations include a transmitter that modulates said first and second signals, respectively, with said message information using a modulation time interval which is no longer than a few multiples of said propagation delay.

wherein said mobile station receiver reconstructs said message information from said first and second signals received during a reception time interval which is at least as long as said propagation delay, and

wherein said first base station terminates transmission of said first signal while said second base station continues to transmit said second signal to thereby handoff said mobile station from said first base station to said second base station.

58. A cellular mobile radio system for servicing calls to and from a plurality of mobile stations located within an area of coverage that is divided into a plurality of cells, said system providing for handover of a call in progress to one of said mobile stations as said mobile station moves between adjacent cells, said system comprising:

a first base station for transmitting a first signal including message information into at least one of said plurality of cells, said message information transmitted as a sequence of symbols representing a call to one of said mobile stations;

a second base station for transmitting a second signal, including substantially the same message information as transmitted by said first base station, into said at least one of said plurality of cells, said second base station commencing the simultaneous transmission of substantially the same message information as said first base station prior to said handover of said call from said first base station to said second base station; and

at least one mobile station located within said at least one of said plurality of said cells wherein said first and said second signals are received by said mobile station with a time shift therebetween wherein said time shift arises from a difference in a first radio propagation delay between said at least one mobile station and said second base station, said at least one mobile station further including a receiver that recovers said message information from a combination of said first and said second signals received during a reception time interval which reception time

interval is greater than said time shift, said system performing the handover of said call in progress by terminating the transmission of said first signal when said mobile station moves from said at least one of said plurality of cells into an adjacent cell.

59. A cellular mobile radio system for servicing calls to and from a plurality of mobile stations located within an area of coverage that is divided into a plurality of cells, said system providing for handover of a call in progress to one of said plurality of mobile stations as said one of said plurality of mobile stations moves between adjacent cells, said system comprising:

a plurality of base stations associated with said plurality of cells for transmitting radio signals into said cells, each base station including a transmitter that is adapted to digitally modulate the radio signals with message information, one of said radio signals being modulated with message information representing said call in progress to said one of said plurality of mobile stations, said modulation being carried out with modulation time intervals which are no longer than a few multiples of a propagation delay associated with reception of said radio signals; and

each of said plurality of mobile stations having a receiver that reconstructs the digital modulation of plural corresponding radio signals respectively received during a reception time interval from the plurality of base stations, said reception time interval is at least as long as said propagation delay, said system performing a handover of said call in progress from a first one of said plurality of base stations to one of said plurality of mobile stations in one of said plurality of cells by commencing the simultaneous transmission from a second one of said plurality of base stations in an adjacent cell of substantially the same message information as transmitted by said first base station and terminating the transmission of said message information from said first base station when said mobile station has moved into said adjacent cell.

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60. A cellular mobile radio system for communicating message information across an area of coverage, comprising:

a plurality of cells, each of said plurality of cells representing a geographic division of said area of coverage;

a first base station for transmitting a first signal including message information into at least one of said plurality of cells, said first base station including a transmitter that modulates a radio carrier with said message information, said message information being represented by a sequence of symbols;

a second base station for transmitting a second signal, including substantially the same message information as transmitted by said first base station, into said at least one of said plurality of cells, said second base station including a transmitter that modulates said radio carrier frequency with said substantially the same message information; and

at least one mobile station located within said at least one of said plurality of said cells, wherein said first and said second signals are received by said mobile station with a time of arrival difference therebetween;

said at least one mobile station further including a receiver that combines said message information from said first and said second signals received during a reception time interval which reception time interval is greater than said time of arrival difference.

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61. A cellular mobile radio system for communicating message information and having a plurality of cells, comprising:

a first base station for transmitting a first signal having message information into a cell,

a second base station for transmitting a second signal having said message information into said cell,

a mobile station in said cell having means for receiving said first and second signals, wherein said first and second signals are received with a propagation delay therebetween,

wherein both of said first and second base stations include means for modulating said first and second signals, respectively, with said message information

using a modulation time interval which is no longer than a few multiples of said propagation delay, and

wherein said mobile station includes means for combining information from said first and second signals received during a reception time interval which is at least as long as said propagation delay.

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62. A cellular mobile radio system for communicating message information across an area of coverage, comprising:

a plurality of cells, each of said plurality of cells representing a geographic division of said area of coverage;

a first base station for transmitting a first signal including message information into at least one of said plurality of cells, said first base station including a transmitter that modulates a radio carrier with said message information, said message information being represented by a sequence of symbols;

a second base station for transmitting a second signal, including substantially the same message information as transmitted by said first base station, into said at least one of said plurality of cells, said second base station including a transmitter that modulates said radio carrier frequency with said substantially the same message information; and

at least one mobile station located within said at least one of said plurality of said cells

wherein said first and said second signals are received by said mobile station with a time shift therebetween wherein said time shift arises from a difference in a first radio propagation delay between said at least one mobile station and said first base station and a second propagation delay between said at least one mobile station and said second base station

said at least one mobile station further including a receiver that combines said message information from said first and said second signals received during a reception time interval which reception time interval is greater than said time shift.

REMARKS

Entry of the foregoing claims, reconsideration and allowance of the above-identified application are respectfully requested. Claims 1-62 will be pending upon entry of the foregoing amendments.

Initially, Applicants would like to thank Examiner Safourek for the courtesy and helpfulness extended to the undersigned during the interview held on September 5, 1997. The foregoing amendments, and subsequent comments, follow the course of action outlined by the undersigned during the interview. **As mentioned during the interview, Applicants would greatly appreciate the Examiner's prompt response to this paper so that prosecution of this Reissue application can be brought to a close.** Pursuant to 37 C.F.R. § 1.116, the new claims added herein are necessary, and were not earlier presented, for the reasons set forth in the Supplemental Declaration enclosed herewith. To summarize the information set forth in the Supplemental Declaration, each of the foregoing claims was drafted in response to the recognition, subsequent to the issuance of the Official Action dated June 13, 1996, of new errors which render the patent undergoing reissuance at least partially inoperative. Specifically, it was recognized that (1) the pending claim language describing the manner in which signals are reconstructed could arguably be construed to be broader than combining those signals and (2) the pending claim language does not, in addition to the current claim recitations, also explicitly contain certain handover-related features. Since these errors were not recognized until after the Ex parte Quayle Action had issued, Applicants did not have an opportunity to present the amendments necessary to correct these errors at an earlier time.

It is believed that all of the formal matters associated with this Reissue application have been addressed. Specifically, the ribbon-copy of U.S. Patent No. 5,088,108 was submitted on October 15, 1996, as was the Certificate Under 37 C.F.R. § 3.73(b). If, however, any remaining informalities exist, please contact the undersigned telephonically (703-838-6642) so that prosecution of this application may be expedited.

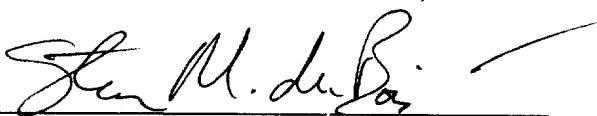
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Respectfully submitted,

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